

S/N 09/259,849

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Paul A. Farrar

Examiner: Dilinh P. Nguyen

Serial No.: 09/259,849

Group Art Unit: 2814

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Docket: 303.557US1

For: CONDUCTIVE STRUCTURES IN INTEGRATED CIRCUITS

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This responds to the Notice of Non-Compliant Appeal Brief mailed on April 16, 2007. In compliance with M.P.E.P. §1205.03(B) and 37 C.F.R. §41.37(c)(1)(v), Appellant submits the following corrected section from Appellant's previously-submitted Appeal Brief filed April 13, 2006.

Please replace the previously-submitted Summary of Claimed Subject Matter Section 5 with the below replacement:

5. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 – Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 1 includes a method of forming a conductor comprising depositing an insulator (125) over a planarized surface; etching a trench (130) having a depth on the insulator; depositing a barrier layer (135) on the insulator; depositing a seed layer (140) directly on the barrier layer; removing the barrier layer and seed layer from selected areas (160) of the insulator, leaving a seed area (155); and depositing a conductor (145) on the seed area by a selective deposition process after removing the barrier layer and seed layer from selected areas of the insulator; wherein the selected areas are directly on a top surface of the insulator.

Claim 4 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 4 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) on the oxide layer; depositing a seed layer (140) on the barrier layer without a layer between the seed layer and the barrier layer; removing the barrier layer and seed layer from unused areas (160) of the oxide layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer and seed layer from unused areas of the oxide layer; wherein the unused areas are directly on a top surface of the oxide layer.

Claim 12 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 12 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of tantalum on the oxide layer; depositing a seed layer (140) selected from the group consisting of gold, silver, and copper on the oxide layer;

removing the barrier layer of tantalum and seed layer from unused areas (160) of the oxide layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer of tantalum and seed layer from unused areas of the oxide layer; wherein the unused areas are directly on a top surface of the oxide layer.

Claim 15 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 15 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of tantalum on the oxide layer; depositing a seed layer (140) of gold on the oxide layer; removing the barrier layer of tantalum and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing gold on the seed area after removing the barrier layer of tantalum and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

Claim 19 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 19 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer; depositing a seed layer (140) of silver on the oxide layer; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing silver on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

Claim 23 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 23 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer; depositing a seed layer (140) of copper on the oxide

layer; removing the barrier layer and seed layer from selected areas or unused areas (160) of the oxide layer, leaving a seed area (155); and depositing aluminum on the seed area after removing the barrier layer and seed layer from selected areas or unused areas of the oxide layer; wherein the selected areas or the unused areas are directly on a top surface of the oxide layer.

Claim 27 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 27 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) selected from the group consisting of gold, silver, and copper on the polymer layer; removing the barrier layer and seed layer from selected areas (160) of the polymer layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer and seed layer from selected areas of the polymer layer; wherein the selected areas are directly on a top surface of the polymer layer.

Claim 30 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 30 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) of gold on the polymer layer; removing the barrier layer and seed layer from selected areas or unused areas (160) of the polymer layer, leaving a seed area (155); and depositing gold on the seed area after removing the barrier layer and seed layer from selected areas or unused areas of the polymer layer; wherein the selected areas or the unused areas are directly on a top surface of the polymer layer.

Claim 34 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 34 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) of silver on the polymer layer; removing the barrier layer and seed layer from selected areas (160) of the polymer layer, leaving a seed area (155); and depositing silver on the seed area after removing the barrier layer and seed layer from selected areas of the polymer layer; wherein the selected areas are directly on a top surface of the polymer layer.

Claim 38 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 38 includes a method of forming a conductor comprising depositing a polymer layer (125) over a planarized surface; etching a trench (130) on the polymer layer; depositing a barrier layer (135) selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer; depositing a seed layer (140) of copper on the polymer layer; removing the barrier layer and seed layer from unused areas (160) of the polymer layer, leaving a seed area (155); and depositing copper on the seed area after removing the barrier layer and seed layer from unused areas of the polymer layer; wherein the unused areas are directly on a top surface of the oxide layer.

Claim 42 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 42 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) selected from the group consisting of zirconium and titanium on the oxide layer; depositing a seed layer (140) of aluminum-copper on the oxide layer; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing a conductor (145) on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

Claim 45 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 45 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of zirconium on the oxide layer; depositing a seed layer (140) of aluminum-copper on the oxide layer; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); and depositing aluminum on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer.

Claim 50 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 50 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) on the oxide layer; depositing a barrier layer (135) of titanium on the oxide layer; depositing a seed layer (140) of aluminum-copper on the barrier layer; removing the barrier layer and seed layer from selected areas or unused areas (160) of the oxide layer, leaving a seed area (155); and depositing aluminum on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

Claim 56 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 56 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) having a top (170) on the oxide layer; depositing a barrier layer (135) of tantalum nitride on the oxide layer; depositing a seed layer (140) of copper directly on the barrier layer of tantalum nitride without a layer between the seed layer of copper and the barrier layer of tantalum nitride; removing the barrier layer and seed layer from selected areas (160) of the oxide layer; depositing a conductor (145) on the seed area leaving a seed area; and depositing a layer (150) of tantalum nitride above the conductor after removing the barrier layer and seed layer from selected areas of the oxide layer; wherein the selected areas are directly on a top surface of the oxide layer.

Claim 67 - Application page 6, line 18 through page 9, line 2, Fig. 1.

Claim 67 includes a method of forming a conductor comprising depositing an oxide layer (125) over a planarized surface; etching a trench (130) having a top (170) on the oxide layer; depositing a barrier layer (135) of tantalum nitride on the oxide layer; depositing a seed layer (140) of copper on the barrier layer of tantalum nitride; depositing a seed layer of copper directly on the barrier layer of tantalum nitride without a layer between the seed layer of copper and the barrier layer of tantalum nitride; removing the barrier layer and seed layer from selected areas (160) of the oxide layer, leaving a seed area (155); depositing a layer of copper on the seed area after removing the barrier layer and seed layer from selected areas of the oxide layer; and depositing a layer (150) of tantalum nitride above the layer of copper; wherein the selected areas are directly on a top surface of the oxide layer.

Claim 186 - Application page 6, line 18 through page 9, line 10, Fig. 1.

Claim 186 includes a method of forming a conductor comprising depositing an insulator layer (115) over a substrate (105) having at least one device (110); depositing a diffusion barrier layer (120) over the insulator layer; planarizing a surface of the diffusion barrier layer; depositing a different insulator layer (125) over the planarized surface of the diffusion barrier layer; fabricating a connector (165) in the different insulator layer, wherein fabricating the connector in the different insulator layer includes, etching a trench (130) having a depth on the different insulator layer; depositing a barrier layer (135) on the different insulator layer; depositing a seed layer (140) on the barrier layer; removing the barrier layer and seed layer from selected areas (160) of the different insulator layer, leaving a seed area (155); and depositing a conductor (145) on the seed area of the connector by a selective deposition process after removing the barrier layer and seed layer from selected areas of the different insulator layer; wherein the selected areas are directly on a top surface of the different insulator layer.

This summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and its legal equivalents for a complete statement of the invention.

Conclusion

In accordance with M.P.E.P. §1205.03(B) and 37 C.F.R. §41.37(c)(1)(v), only the non-compliant section of Appellant's previously-submitted Appeal Brief has been included in this response.

Appellant respectfully submits that the amendments to Section 5 as provided herein comply with the requirements under 37 C.F.R. § 41.37(c) (1)(v).

Appellant respectfully requests the withdrawal of the non-complainant status of Appellant's previously-submitted Appeal Brief.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

PAUL A. FARRAR

By his Representatives,

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Date

16 May '07

By



Timothy B Clise

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 16 day of May, 2006.

Name

KATE GANNON

Signature

